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THE PHARMACIST'S ROLE IN VOCATIONAL GUIDANCE

In the last issue reference was made to the fact that the attitude of the public to any profession is dependent, in the final analysis, on the individual practitioner. In his mode of practice, in his personal living, and in his community life he is, wittingly or unwittingly, the show window of his profession. Any sort of public relations campaign - newspaper, radio or television - can only be effective if the pharmacist himself reflects the principles proclaimed through such media on behalf of the profession.

An example of a community service which pharmacists might well render on a larger scale than at present is in the realm of vocational guidance. By a regular, annual, well planned programme of assistance in every Ontario community where there is a secondary school, pharmacists would be providing invaluable assistance to young men and women during that somewhat bewildering period when they are striving to find the vocation which best suits them. At the same time the self-interest of Pharmacy would also be served. Not only would such a programme be good for our public relations, but the profession would be assured of an adequate supply of candidates who are more certain than many freshmen are to-day that they have chosen their vocation wisely.

It is no secret that, apart from Metropolitan Toronto, Ontario communities are not sending their quota of students for training in Pharmacy. As a consequence it is difficult to find graduates to accept posts in many parts of the province. If, for example, a student comes from Toronto or Kitchener or Hamilton, he usually prefers to return there rather than accept a position in Cornwall or Fort William or Sarnia. This cannot be blamed on the four

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The New Pharmacy Act

Wherever Pharmacists have gathered lately the conversation has turned to the New Pharmacy Act.

The mere passing without considering its context, of a new act, was somewhat of a mile stone in Pharmaceutical History. While there have been amendments to the Act over the last few years, the main clauses of the old Act went back as far as 1871.

The Council of the College since 1945 had been working to have certain changes made in the Act to bring it in line with present day Pharmacy. Following passing of the ammendments in 1952, Council felt the Act was in fairly satisfactory form. However, you will remember that the Minister of Health addressing the O.R.D.A. Convention that year, stated that he intended to bring in a new Act and asked if the College had any ideas to submit them.

The new Act has now been passed but has not yet received assent. There seems to be some uncertainty as to when it will. I am sorry that we cannot mail you copies of the Act until it has received this assent and the regulations will be printed with it.

As far as the changes or additions to the Act are concerned, I cannot give you much more information than you have already read in the Pharmaceutical press.

I might mention, however, some of the important features.

The Act is now divided into four parts:

Part I deals with the O.C.P. and the registration of Pharmacists

Part II deals with sale of poisons and drugs.

Part III Offences and Penalties.

Part IV Repeal of old Act and commencement of new.

The first section is completely new. It gives definitions of various terms used in the Act.

Two of these definitions are very important - viz (d) "drug" and (i) prescription. I quote the two definitions.

(d) "drug" means any substance,

(i) that is named in the latest edition from time to time of the British Pharmacopoeia, British Pharmaceutical Codex, Pharmacopoeia of the United States of America, National Formulary, New and Nonofficial Remedies, Canadian Formulary, Codex Francais and Pharmacopoea Internationalis, and any preparation containing any such substance, and

(ii) that is offered for sale or sold for the prevention or treatment of any ailment, disease or physical disorder.

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Chemotherapeutic Agents in the Treatment of Tuberculosis.

Tuberculosis is referred to as far back as 5,000 B.C. under various names- phthisis, scrufula, consumption, white plague and king's evil. The word tuberculosis is of fairly recent origin. It was stated in 1815 that pulmonary consumption was a disease "so frequent as to carry off prematurely about one-third part of the inhabitants of Europe, and so fatal as often to deter the practitioner even from attempting a cure". The same source reports that not one patient in a thousand recovered from consumption without medical assistance, and that the best possible care would, at the most, save the life of one in a hundred. This situation has been much improved in modern times through the use of various procedures, and latterly, chemotherapeutic agents. Despite such improvement, tuberculosis is still the largest single cause of death between the ages of 15 and 30. There are some 30 - 50 million persons with tuberculosis in the world of whom some 3 - 5 millions die yearly.

Although the specific aspect to be discussed here is that of the chemotherapy of tuberculosis, it is pertinent to outline the disease and its treatment under four headings - infection, prophylaxis, curative measures and chemotherapy.

Infection -

Most people normally have a tuberculous infection at some time or other in their life. Normally the infection is trivial and is overcome. Either the bacilli are destroyed or alternatively a layer of fibrous tissue is laid around the infected area, thus shutting it off from the rest of the body. The blood supply and nutrition are thus cut off from that focus and sometimes caseation occurs, that is, a localized cheesy mass forms, which later calcifies, so that a hard calcareous nodule is formed. It is possible that some organisms may remain dormant for years enclosed in the calcified focus. The patient acquires a sensitivity and in many cases, a resistance to the tubercle bacillus.

In other cases the primary infection is not overcome and the condition progresses. In the lungs the infection may be too virulent, and, although fibrosis occurs, the caseating mass forms a cavity and the bacilli invade the surrounding fibrosing tissue so that the cavity enlarges.

Tuberculosis is, of course, both a systemic as well as a local disease, the systemic manifestations being the asthenia or loss of strength, the high temperature, loss of appetite and weight; localized effects are ulcers and cavitation. The acute caseating lung lesions of tuberculosis give rise to both effects, and this type of case forms a severe test of the efficiency of any anti-tubercular drug.

Prophylaxis -

Until recent years prophylaxis was really the most effective method, and consisted of various public health measures resulting in the setting up of what was, to all intents and purposes, a separate health service for the treatment of tuberculosis. Malnutrition and any debilitating condition, as for example, diabetes, may predispose toward a successful invasion by tubercle bacilli. Thus prophylaxis against the human tubercle bacillus is provided by ensuring that the population are adequately fed and by maintaining public health programmes. Prophylactic measures against bovine infection consist of pasteurizing milk as an immediate measure, while exterminating infected cattle.

Curative Measures

Curative treatment is based upon good nutrition, rest, surgery where appropriate, and, nowadays, upon chemotherapy. Surgical treatment may consist of excision of the infected part, as when a lobe (lobectomy) or a complete lung (pneumonectomy) are removed, or of collapsing the lung. This latter, by reducing the movement of the affected lung, tends to provide optimum conditions to enable the

body tissues to seal off the infected focus by fibrosis. Various techniques are utilized in preventing the mechanical expansion of the lung. Resection of one or two ribs and packing plastic material on the outside of the pleura, forces it up against one of the lungs. In the absence of ribs that part of the chest does not expand, and therefore the adjacent lung tissue is not expanded. The operation is known as thoracoplasty. Alternatively, air can be pumped into the pleural cavity in the infected side, so that an artificial pneumothorax with a positive pressure is created, and the lung is collapsed. A further method is to force the diaphragm upwards on the affected side either by pumping air into the peritoneal cavity below or by crushing the phrenic nerve and thus paralyzing the diaphragm on the same side.

Chemotherapy

There are a number of general principles which are accepted by most workers in the chemotherapy of tuberculosis, as follows:

(1) Drug therapy alone is not adequate treatment of tuberculosis.
(2) The administration of antimicrobial agents should be carefully correlated with an over-all programme of surgical and medical treatment.
(3) Usually this should be done in a tuberculosis hospital or the tuberculosis division of a general hospital.
(4) The emergence of drug-resistant strains of tubercle bacilli may be delayed by the simultaneous administration of certain combinations of antimicrobials.
(5) The best combination available today is one of the streptomycin drugs together with some form of PAS.

Chemotherapeutic Agents

Although the tuberculosis problem is so important, as the previously quoted mortality figures indicate, control of the disease has not been accomplished to nearly the same degree as in other infections, despite almost a hundred years of research. It is unfortunately true that this fungus like organism is practically immune to many chemotherapeutic agents which are so spectacularly effective against other bacteria. The common antibiotics such as penicillin, aureomycin, and chloramphenicol, as well as the sulphonamide drugs, are without significant effect. In this intractableness, tuberculosis is almost unique among bacterial diseases. It is difficult to overemphasize this point, because the whole problem of its chemotherapy has hinged upon this outstanding and unfortunate characteristic. It has also been responsible, in part, for a major misconception concerning the structure of the tubercle bacillus. According to the generally accepted concept, the intractable nature of the tuberculous infection and the resistance of the tubercle bacillus to chemotherapeutic agents were due to a waxy capsule surrounding the organisms and also the necessity for a chemotherapeutic agent to penetrate the caseated and calcified nodules. On the assumption that penetration of the organism by the drug was an essential prerequisite for antitubercular activity, it seemed reasonably certain that the desired therapeutic effect could be achieved only with fat soluble materials which could penetrate through the waxy envelope. It is now known that fat-solubility is not required. Indeed, all the effective tuberculostats known to date are either water soluble or are highly polar molecules of the type associated with water-solubility rather than fat solubility. The present picture is of a mosaic surface permeable at least in some sections to water soluble substances. The general difficulty of dealing with the tubercle bacillus may be summarized in the following points.

(1) The bacillus is often surrounded by a region of fibrosis, itself difficult to penetrate.
(2) The bacillus probably has some type of wax like covering which tends to prevent ready diffusion of drug substance into the cell.
(3) Most tuberculosis is chronic in character and the tubercle bacillus can remain viable in the patient for long periods of time without provoking an acute struggle by the patient's defense mechanisms.

4) The patient's defensive mechanisms seem slower and less certain for this disease as compared to the case with other infections, so that even though the disease process has been slowed or suppressed by means of a tuberculostat, the host is not capable of rapidly destroying the invading organism.

Sulphones

Chronologically, these are the first of the modern tuberculostats. The tuberculostatic activity of 4.4'-diaminodiphenylsulphone, the parent substance of the group, was discovered in 1939 and since that time many attempts have been made to develop sulphones with decreased toxicity and increased solubility and activity. No notable success in this direction has been achieved. Derivatives, such as promin, diasone, and sulphetrone, although more soluble and less toxic, are also less active than the parent substance. Promizole, a slightly later development in the sulphone field, appears to be somewhat better than the others. The sulphones are all somewhat toxic, and no one of them is sufficiently tuberculostatic to serve effectively as the sole chemotherapeutic agent in the treatment of clinical tuberculosis. The sulphones seem to have a transient effect only in certain types of tuberculous infection, as in the miliary types associated with blood (aqueous) carried infection, and not in those more persistent types of infection due to organisms in lipoids or in caseated tissues. However, sulphetrone has been reported as successful in the treatment of leprosy, the causative organism of which has some physical resemblance to the organism causing tuberculosis.

Sources

Promizole (Parke-Davis). Tablets containing 0.5 Gm. of promizole (2,4'-diamino-5-thiazolylphenyl sulfone).

Antibiotics

Some thirty odd antibiotic substances, isolated within the last decade, are said to possess in vitro tuberculostatic properties. Only the streptomycins are used clinically to any extent. Streptomycin is the most effective agent available for the treatment of tuberculous meningitis, pulmonary and miliary tuberculosis. Certain disadvantages attend its use. It is poorly absorbed from the intestines so that parenteral administration is essential. Also, the tubercle bacillus fairly readily acquires resistance to streptomycin, making prolonged courses of treatment impossible. Combined therapy with streptomycin and p-aminosalicylic acid (PAS) delays the onset of streptomycin resistance. Because of neurotoxic symptoms which may arise with administration of streptomycin, dihydrostreptomycin, which has not this side reaction, is also widely employed. It has been observed that dihydrostreptomycin is less likely to cause allergic reactions, such as drug fever and dermatitis, and should therefore be substituted for streptomycin when such developments occur.

It is generally agreed that the therapeutic results obtained with streptomycin are due largely to the suppression of the tuberculosis infections. It prevents the development of new lesions, but without producing complete or biological cure. This is evident in the fact that relapsing infections have often been observed on discontinuance of treatment, especially in cases with persistently positive sputum or uncollapsed cavities and in individuals with emaciation and low natural resistance.

Streptomycin has also been of great value in the treatment of many of the complications of pulmonary tuberculosis as in laryngitis and tracheo-bronchitis. The antibiotic has also proved effective in the healing of draining sinuses, and, in conjunction with surgery, in genito-urinary tuberculosis and in tuberculosis of the bones and joints.

It has been found that it is not necessary nor even desirable to give streptomycin daily. The administration of 1 Gm. intramuscularly 2 or 3 times weekly or 2 Gm. every 3 days is as effective as the use of daily doses of 1 Gm. Such intermittent therapy produces fewer toxic reactions and few resistant strains.

Streptomycin and dihydrostreptomycin are excreted by the kidney. If kidney unction is impaired, the drug may accumulate and give rise to toxic effects. It s wise to determine kidney function in doubtful cases before treatment. If kidney unction is below normal, the dose should be adjusted downward to allow for this.

Terramycin appears to have definite value, particularly as a substitute for AS in combined streptomycin therapy. Some patients cannot tolerate PAS and in hese it is sometimes replaced by a daily oral dose of 5 Gm. of terramycin (plus streptomycin - 1 Gm. three times weekly or 2 Gm. every three days).

Sources

Streptomycin - supplied as the hydrochloride, sulfate or calcium chloride complex in 1 and 5 Gm. vials. Stable white to tan powder, readily soluble in water or physiological salt solution. Each mg. of commercial dry powder represents the equivalent of not less than 300 micrograms of streptomycin base. One gram of streptomycin base is equivalent to 1,000,000 units. With the calcium chloride complex, 1.3 Gm. is equivalent to 1 Gm. streptomycin base. (Abbott, Lilly, Merck, Merrell, Parke Davis, Pfizer, Sharp and Dohme, Squibb, Upjohn, Winthrop-Stearns)
Dosage 0.25 Gm. to 2.0 Gm. daily for 5 to 10 days, by intramuscular injection.

Dihydrostreptomcyin Sulfate - (Abbott, Bell-Craig, Bristol, Glaxo, Lilly, Merck, Merrell, Parke Davis, Pfizer, Squibb, Upjohn, Winthrop-Stearns, Wyeth) - usually supplied in 1 and 5 Gm. vials.
Dosage 0.5 to 1.0 Gm. by intramuscular injection every 12 hours for 40 to 120 days.

Para aminosalicylic acid (PAS) - This compound is limited mainly to blood-borne tuberculous infections. Most of the clinically tried anti-tuberculosis drugs must work quickly or they fail, and hence there is a tendency to restrict their use to helping to build up the patient prior to such treatment as collapse therapy. PAS is relatively non toxic to humans but owing to its rapid absorption and excretion frequent doses are necessary to maintain an adequate concentration in the blood. Combined therapy with sodium benzoate or caronamide retards the elimination and consequently increases the serum concentration of the acid.

PAS is of use in the exudative type of tuberculosis, for chronic pulmonary tuberculosis with cavities and for tuberculosis of the bronchi, larynx, cervical nodes, urinary tract and middle ear. At present the principal indication for the use of PAS alone is in the treatment of patients in whom bacterial resistance to streptomycin has already occurred.

The combined action of streptomycin and p-aminosalicylic acid, which are synergistic, lends support to the idea that these two substances act by entirely different mechanisms. Such a combination is the therapy of choice in the acute and progressive forms of pulmonary tuberculosis, tuberculosis of the genito-urinary tract and in tuberculosis of the bones and joints.

The current situation with respect to the advantages of combined therapy have been summarized as (a) greater therapeutic effectiveness than can be obtained with either streptomycin or PAS alone, and (b) postponement of the emergence of streptomycin resistant strains of tubercle bacilli in treated patients.

PAS should be given daily, preferably as the sodium salt. The daily dose should be 15 Gm. (in divided doses) in terms of PAS. Enteric tablets are available to reduce the gastric irritation observed in some patients. Alternatively, the sodium salt has also been given parenterally to avoid this symptom.

Sources

Para-Aminosalicylic Acid (PAS) - White, crystalline, supplied in tablet or powder form. (Merck, Ayerst, Bell-Craig). Dosage - Orally, 10 to 15 Gm. per day in 4 or more divided doses.

Panisyl (Parke, Davis) - Brand of PAS, available in tablet or powder form.

Pasara Calcium Granulate (Smith-Dorsey) - Calcium salt of PAS supplied in form of granules coated with a sialoresistant substance. Available in 0.5 Gm. capsules and powder. Dosage - Orally, in doses of 5 Gm. 3 times daily at 8 hour intervals.

Propasa (Sharpe & Dohme) - Effervescent tablets each containing 1.0 Gm. of para-aminosalicylic acid. Dosage - Orally, 15 to 20 Gm. daily in divided doses.

Paramas (Bell-Craig) - Powder and 0.5 Gm. enteric tablets of PAS.

Sopramas (Bell-Craig) - Powder, Ampoules (10 cc. of 20% solution) and 0.5 Gm. enteric tablets of the sodium salt of PAS.

Rhopas (Poulenc) - Supplied as coffee flavoured granules containing 60% of sodium salt of PAS, or as 0.5 Gm. enteric tablets.

Aminacyl (Wander) - Tablets of sodium PAS.

Paramisan Sodium (Nivea) - Sodium PAS in powder, tablets, cachets and ampoules.

Thiosemicarbazones.

Most sulphonamides are ineffective against the tubercle bacillus, but more definite activity is exhibited by those containing heterocyclic nuclei, such as sulphathiazole and sulphathiadiazole, from which the thiosemicarbazones are derived by structural analogy. Tibione, described by European workers, has been shown to be superior to PAS but inferior to streptomycin. Tibione is now widely used in Europe but has not received much attention in this country, because its use is accompanied by a high incidence of severe side reactions, including gastric disturbance, anaemia and liver and kidney damage. When used in combination with streptomycin, it does not give results comparable to streptomycin-PAS since it does not reduce the emergence of streptomycin resistant forms.

Sources

T.B. - 1 (Mowatt & Moore); An - T - B (Nadeau); Seroden (Allen and Hanbury) - 25 or 50 mg. tablets of 4-acetyl-aminobenzaldehyde-thiosemicarbazone. Adjunct in the treatment of tuberculosis.

Derivatives of Isonicotinic Acid

The hydrazide of iso-nicotinic acid has only relatively recently been introduced. The first clinical reports came from the 12,000 bed Sea View Hospital in New York. Patients chosen for treatment included those suffering from the caseating type of tuberculosis, as well as extra-pulmonary cases. These represented conditions which had not hitherto responded very well to chemotherapy, or which had become resistant to further treatment. Within two weeks of commencing treatment with the drug, marked clinical improvement was apparent. The high temperatures characteristic of these patients fell to normal, sometimes precipitately, and there was a marked increase in appetite, weight and general sense of well-being. A considerable reduction in cough and expectoration was also soon apparent and toxic reactions to the new drug were noticeably absent. Clinical improvement was often confirmed radiologically, when a reduction in the size of lung cavities was frequently observed.

Isonicotinyl hydrazide, also known as isoniazid, is relatively non-toxic and can be given both orally and parenterally. The dose is 150-300 mg. daily taken in divided doses.

Like the other anti-TB agents, emergence of strains resistant to it has been shown. Preliminary studies using streptomycin, 1 Gm. 3 times weekly, plus isoniazid

150-300 mg. per day are encouraging. It appears that this combination is the equal of and possibly better than streptomycin-PAS. It has the further advantage of not being as likely to cause gastric distress and causing more subjective improvement.

Sources

Isonicotinic Acid Hydrazide - White crystalline powder highly soluble in water, available in 50 mg. tablets. For use as emergency treatment of patients with tuberculosis failing to respond to streptomycin as a preoperative procedure and as an adjunct in the treatment of patients who are critically ill due to streptomycin resistant tuberculosis or who are failing to respond to streptomycin therapy. Dosage - orally, 3 to 4 mg. per kg. body weight daily in divided doses not to exceed 150 to 200 mg. per day. In acute forms of the disease such as miliary or meningeal tuberculosis, doses of up to 7 mg. per Kg. of body weight per day may be given for not more than 7 to 10 days.

Dinacrin (Winthrop), Ditubin (Schering), Nicetal (Wander),
Pyricidin (Frosst), Hydrazid (Squibb), Rimifon (Roche),
Niconyl (Parke, Davis), INH (Lilly), Isolyn (Abbott)
Armazide (Armour), Tisin (Casimir Funk)

D. H. Murray.

Methyl Cellulose in Ophthalmology.

Mr. Harry A. Smythe, Phm.B. of Hamilton, Ontario has already provided the practising pharmacist with an introduction to the chemistry and properties of Methyl Cellulose (see Vol.1, 5). This interesting substance has assumed an important place in pharmacy and medicine, in addition to its many other specialized uses. The ophthalmologist recognizes its usefulness as a vehicle in diverse eye preparations and it is here that the pharmacist may be of service to him. However, the prescription so filled occasionally varies from pharmacist to pharmacist and it is the intention here to point out a few features of import in connection with the dispensing of solutions containing methyl cellulose and some general remarks on its properties. The material presented will be primarily an abstract of an article by Professor Gordon A. Bergy which appeared in the American Professional Pharmacist for April, 1952. The information compiled by Professor Bergy should also serve to make the practising pharmacist aware of the great value to him of such professional journals as the American Professional Pharmacist, Practical Pharmacy Edition of the American Pharmaceutical Association and others that we would like to recommend.

It is important that the dispenser secure the pharmaceutical grade of methyl cellulose and not the technical since the clarity of films and solutions is better with the former.

The substance is soluble in cold water, not hot, and is stable in alkali and dilute acids. For the most part it is insoluble in saturated salt solutions and the majority of organic solvents. Aqueous solutions may be diluted with alcohol, however, and appear to be compatible with most drugs used in ophthalmology. There is a tendency to foam in solution but this is not an undesirable property. It might be worth while here to review the method of solution preparation. Twenty-four hours will be required to prepare a satisfactory solution by simply using cold water. The better method is to wet the fibres thoroughly with hot distilled water (80 to 90°C.) and allow maceration to take place for 20 to 30 minutes. Cold water or ice may then be added and the mixture stirred until smooth and clear. It is necessary, of course to have the ice prepared using distilled water.

Bergy lists several prescriptions that have been directed to his attention:

For most purposes, cooling to room temperature will give solutions of the necessary clarity but this is not so for ophthalmic use. The solution should be cooled to 5 to 10°C for maximum clarity and the pharmacist should realize that small particles or fibres may not be visible at higher temperatures but nevertheless are present. The colloid cannot be filtered but any undissolved fibres may be removed by long standing or by means of the centrifuge. Stock solutions, say 2% may be kept in the refrigerator at 5 to 10°C.

One of the advantages connected with the use of methyl cellulose is the fact that it does not require a preservative if the water used is comparatively free of micro-organisms and the solution used within a reasonable period of time. However, improper and unsanitary conditions of preparation will lead to spoilage.

The presence of soluble salts in methyl cellulose solutions has a marked influence on the temperature of gelation. The addition of a soluble salt in high concentration to the solutions can cause precipitations at ordinary temperatures. The degree of salt tolerance is a function of the valence of the positive ion and of the negative ion. The higher the valence of either, the lower will be the limits of tolerance. For example, phosphates, sulfates and tartrates have lower limits of tolerance than acetates, chlorides, nitrites and nitrates in that order.

Viscosity Considerations.

Methyl cellulose appears on the market in the following viscosities: 10, 15, 25, 50, 100, 400, 1500 and 4,000 c.p.s. (centipoise seconds). By means of suitable blending charts intermediate viscosities may be obtained. If the pharmacist is asked to prepare an eye solution of a certain viscosity he can consult the Methocel Viscosity Concentration chart supplied by Dow Chemical Company and secure his values. For example, a 1% w/v solution of the 4,000 c.p.s. type at 20°C will give a colloidal solution with a value of 300 centipoises, while a 4.75% w/v solution of the 25 c.p.s. type will give a solution of 300 centipoises. The Methocel Blending Chart will provide him with information concerning the relative proportions of the different viscosity types that must be used to secure another intermediate viscosity.

Ophthalmic Applications

As a vehicle for ophthalmic medicaments, a cellulose solution prepared from the 4,000 type may be instilled by means of a small bore dropper but for higher concentrations collapsible tubes should be used. Aqueous methyl cellulose gets away from the oily, greasy type bases that have been used almost exclusively in the past and various ophthalmologists have commented on the fact that the greasy materials do not permit of even application, do not adhere uniformly, do not mix with the conjunctival secretion, etc. Aqueous vehicles containing methyl cellulose reduce the danger of irritation of the conjunctiva and spread smoothly and uniformly throughout the conjunctival sac. In addition, the solutions remain for a longer period of time and thus promote absorption of many drugs. In some cases there is adsorption of the drug by the colloidal cellulose and a reduction in tissue penetration.

Solutions of the compound have a lubricating action similar to normal conjunctival mucus and are useful in applying contact lens. The solution adheres to the lens and permits fitting to the eye. Swan used a concentration of 0.5 to 1% of the 4,000 c.p.s. type dissolved in 0.9 to 1.2% sodium chloride. Solutions of methyl cellulose are also useful for gonioscopic lenses where the lens is held in position by capillary attraction without any damage to the corneal epithelium. Buffering of the solutions may be desirable but is apparently not always necessary.

℞ Sodium Chloride gr. 8
Methyl Cellulose (25 centipoise)
1% in water q.s. ad dr. 1/2
Sig: Gtts. 1 in left eye every 3 hours

℞ Methyl Cellulose (4,000) c.p.s. 1/4%
Zephiran 1 : 5,000 q.s. dr. 4
Sig: as directed

℞ Cortone acetate (2.5% topical) 1 cc.
Methyl Cellulose (25 c.p.s.) 1% in
Normal Saline 4 cc.
Sig: Gtts unam instillante in O_2 q. h/2
durante die et q. 2. h. durante nocte.

In this prescription the methyl cellulose is hydrated in normal saline. It may be sterilized and after cooling, the cortone suspension is added.

℞ Terramycin HCl 25 mg.
NaCl. 6.25 mg.
Methyl Cellulose (25 c.p.s.) 1%
aqueous and sterile solution 5 cc.
Sig: One drop in each eye every half hour
and 2 drops every hour during the night.

℞ Aureomycin H Cl 25 mg.
Sodium Chloride 62.5 mg.
Sodium Borate 25 mg.
Methyl Cellulose 25 c.p.s. 1% in water and
sterile ad 5 cc.

℞ Chloramphenicol 25 mg.
Borate (buffer aqueous 100 mg.
Boric Acid) 25 mg.
Methyl Cellulose 25 c.p.s. 1%
aqueous and sterile ad 5 cc.

These three are standard packaged items to be diluted only by the addition of the prescribed amount of methyl cellulose solution. Dilution can be carried further if desired.

℞ Terramycin (nasal) with desoxyephedrine 25 mg.
Methyl Cellulose 25 c.p.s. 1% aqueous and
sterile ad 5 cc.

Scigliano states that in the U.S. Public Health Service the following buffered vehicle is used for alkaloidal salts:

Methyl Cellulose 4,000 c.p.s. 0.33 Gm.
Sodium Chloride 0.45 Gm.
Hind and Goyan's Phosphate Buffer 50.0 cc.
Benzalkonium Chloride U.S.P.
1:25,000 solution to make 100.0 cc.
pH 6.8

The pharmacist will find a wide variety of uses for Methyl Cellulose but for ophthalmic use it is particularly valuable. A 1% solution of the 25 c.p.s. approximates very closely the same indices of refraction as is possessed by the humors and lens system of the eye. The dispenser should take care to use the pharmaceutical grade and to use the proper viscosity cellulose when preparing solutions. In addition, he should take pains in the processing of the solutions so that they will be clear, free from contamination and reproducible at all times.

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Bergy, Gordon A., American Professional Pharmacist 18, 340 (1952). The New Methocel, The Dow Chemical Co., 204 - Richmond Street West, Toronto 1. Ontario.

G. C. Walker.

The New Pharmacy Act

(continued from page 16)

but does not include any such substance or preparation offered for sale or sold as, or as part of, a food drink or cosmetic or for any purpose other than the prevention or treatment of any ailment, disease or physical disorder.

(i) "prescription" means a direction from a legally qualified medical practitioner, dentist or veterinary surgeon directing the dispensing of any drug or mixture of drugs to a named person.

The committee had considerable difficulty having the definitions of drug accepted (the department proposed a less comprehensive one) but we felt this was the core of the act and without it the Act would be of little value.

Section 2 deals with exemptions and clause (k) provides for Schedule B items which may be sold by anyone. This list has been largely increased.

Under section 5, Council may increase the electoral districts to fifteen if they so wish.

In section 12, provision is made for filling vacancies on the Council during the term of the Council.

In section 17, the most important new clause, is the provision for appointment of a discipline committee. The powers of such a committee are considerably extended.

Fees are now fixed entirely by By Law instead of by the Act itself.

Section 24 for notification of opening of a new business. The Registrar must be notified at least thirty days before such pharmacy commences business.

Section 26 - In January, at the time of payment of annual fees, each owner must notify the Registrar of those in his employ.

Section 27 - (c) Registration may be cancelled for incompetency or improper conduct.

Section 32 - In future no corporation shall operate a Pharmacy unless a majority of each class of shares is held by pharmacists.

Section 46 - A copy of a prescription must be given if a customer demands such.

I have only touched a few of the important changes

Full copies of the Act will be mailed to all as soon as we can secure them.

H. M. Corbett,
Registrar-Treasurer

(Continued from Cover)

year course because the trend was clearly in evidence during the "forties". I am convinced that the main reason is a lack of knowledge of the varied opportunities which exist in our profession to-day or even, at times, a complete lack of understanding of the nature of pharmaceutical practice. A Grade XII boy in Toronto collegiate institute asked me lately: "What is Pharmacy, does it have anything to do with chemistry?" And a presumably good guidance program exists in his school. It is evident that there is a real need for more co-operation between the schools and those engaged in different vocations.

I suggest that individual pharmacists or, better still, groups of pharmacists organize an annual programme along the following lines:

1. Approach the high school principal and discuss ways in which co-operation may be effective. Following are some.

2. Obtain from Mr. H. M. Corbett, Registrar of the College, a copy of the excellent vocational guidance filmstrip on "Careers in Canadian Pharmacy". This was prepared last year by the Canadian Foundation for the Advancement of Pharmacy and is available without charge. Arrangements may be made to show this film to all Grade XI, XII and XIII students by a pharmacist who could also answer questions.

3. Arrange to have a pharmacist address students who are interested in Pharmacy as a possible career. Ideally, this could be outside of the school and part of an informal evening with local pharmacists as hosts. Later visits to local pharmacies, and in some centres, to pharmaceutical manufacturing plants could be arranged. Helpful literature is available from the College.

4. Bearing in mind that a number of excellent students need some financial assistance if they are to consider a university course, I believe local pharmaceutical organizations would do well to consider establishing one or more bursaries at least $200 each to assist one student (or more) each year entering Pharmacy. In my view, assistance of this kind on a broad scale is badly needed in all university courses. By carefully selecting such students and providing a measure of assistance, the community would benefit because in most cases the students would return for employment following graduation. This is a very practical step which I feel pharmacists in every community would be well advised to take, in their own interest and for better public relations. The Ladies Auxiliary to Toronto Pharmacists have this year offered one $200.00 admission bursary and one $200.00 undergraduate bursary.

F. N. H.

Foundation Awards $1,200 to O. C. P. for Research.

Two research projects at the College this summer are being supported by the Canadian Foundation for the Advancement of Pharmacy in the amount of $600 each.

One of these is under the direction of Professor G. C. Walker who will be assisted by Miss Daria Brygider. The subject of the study is: "The Evaluation of the Fungicidal and Fungistatic Properties of a Series of Benzoin Derivatives."

The other study is on: "The Assay of Acetylsalicylic Acid, Phenacetin and Caffeine". Professor D. H. Murray is directing the problem with the help of Mr. Donald H. Barton.

These grants are further substantial evidence for the valuable contribution being made by the Foundation to Pharmacy in Ontario.

F. N. H.